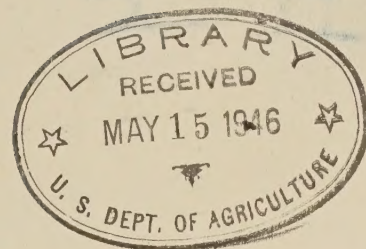


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The EXTENSION ENTOMOLOGIST

During the course of any one year there are many items of interest which come to my attention that I should like to pass along to each of you in the field. I feel quite sure that each of you, also, has had similar experiences, or that you may have done some task an easier way or have launched a new project that would be particularly helpful to your coworkers. These things may seem trivial to you at the time -- but think how many years you have been working as extension entomologist without seeing or doing the thing as you now do it. Mention of some of these things may short-cut the chores of your fellow workers if you will but take the time to jot them down and pass them along.

M. P. Jones

M. P. Jones,
Extension Entomologist.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE AND
EXTENSION SERVICE, COOPERATING

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THE EXTENSION ENTOMOLOGIST

Introduction

For some time a number of us have felt the need for a medium of exchange for the items of interest to extension entomologists. This is the first issue of THE EXTENSION ENTOMOLOGIST. It is so named because the information contained herein will be of particular interest to persons having to do with the extension phases of entomology. It is realized that some of the States do not have a person on their staff who devotes his full time to the extension phase of insect control. It is known, however, that the public in every State needs help in combating its insect pests and that to someone is assigned the task of serving the public in this way. Extension entomologists have expressed a desire to include on the mailing list, and to solicit the cooperation of, those persons giving out insect-control information, but whose States do not have the extension entomology set-up.

Sources of Material

In this first issue will be found such material as is on hand in the Washington office. It is hoped, however, that future issues will carry articles especially prepared for THE EXTENSION ENTOMOLOGIST by its readers.

On several occasions requests have been received for a list of the extension entomologists. Such a list is given below, arranged alphabetically by States. The title of the entomologist and the name of the institution he represents are correct according to the best information at hand. In case of an error, let us know and the correction will be made.

Besides the States that already have extension entomologists, the States are listed that have shown even the slightest indication of expansion in extension entomology - so the list can be kept up-to-date if appointments are made.

| State | College | Location |
|---------------|--|--------------|
| Alabama..... | Alabama Polytechnic Institute..... | Auburn |
| | W. A. Ruffin, extension entomologist.* | |
| Arkansas..... | College of Agriculture, University of Arkansas.... | Fayetteville |
| | ----- | |
| California... | College of Agriculture, University of California..... | Berkeley |
| | ----- | |

* Devotes full time to the work.

| State | College | Location |
|----------------|---|--|
| Colorado..... | State Agricultural College of Colorado..... | Fort Collins Sam C. McCampbell, extension entomologist.* |
| Connecticut... | Connecticut State College..... | Storrs L. B. Crandall, extension apiarist (part time). |
| Delaware..... | University of Delaware..... | Newark Dr. L. A. Stearns, entomologist (1/4 time extension). Dr. Paul Rice, extension specialist in entomology (2/3 time extension). |
| Florida..... | Experiment Station..... | Gainesville E. F. DeBusk, citriculturist (1/4 time ext. ent.) |
| Idaho..... | College of Agriculture, University of Idaho..... | Moscow Dr. Claude Wakefield, entomologist (1/4 time ext.) Dr. W. E. Shull, asst. entomologist (1/4 time ext.) |
| Illinois..... | College of Agriculture, University of Illinois... | Urbana ----- |
| Indiana..... | Purdue University..... | Lafayette G. E. Lehker, asst. extension entomologist * |
| Iowa..... | Iowa State College of Agriculture..... | Ames A. D. Worthington, extension entomologist * George Decker, asst. extension entomologist (1/2 time ext.) Harold Gunderson, entomologist (2/5 time ext.) F. B. Paddock, extension apiarist * Howard Shipton, asst. beekeeping specialist * |
| Kansas..... | Kansas State College of Agriculture..... | Manhattan Dr. E. G. Kelly, extension entomologist * |
| Louisiana.... | Louisiana State University..... | Baton Rouge ----- E. C. Davis, extension apiarist * |
| Maryland..... | University of Maryland..... | College Park Dr. E. N. Cory, State entomologist (1/4 time ext.) C. Graham, asst. entomologist (1/2 time ext.) Dr. George Langford, specialist in insect control (1/2 time ext.) G. J. Abrams, specialist in apiculture (1/2 time ext.) |
| Michigan..... | Michigan State College..... | East Lansing C. B. Dibble, extension entomologist * R. H. Keltz, extension apiarist (part time) |

| State | College | Location |
|-------------------|--|--|
| Minnesota..... | Department of Agriculture of the University of Minnesota..... | St. Paul : 1911 H. L. Parten, extension entomologist * |
| Missouri..... | College of Agriculture, University of Missouri..... | Columbia George D. Jones, extension entomologist * |
| Nebraska..... | College of Agriculture..... | Lincoln O. S. Bare, extension entomologist * |
| New York..... | New York State College of Agriculture..... | Ithaca Dr. R. W. Leiby, extension entomologist * Dr. W. E. Blauvelt, asst. extension en- tomologist * J. A. Evans, asst. extension entomologist * George H. Rea, extension apiarist * |
| North Carolina... | State College Station..... | Raleigh J. O. Rowell, extension entomologist * |
| North Dakota..... | North Dakota Agricultural College..... | Fargo F. Gray Butcher, extension entomologist and plant pathologist * |
| Ohio..... | Ohio State University..... | Columbus T. H. Parks, extension entomologist * T. B. Whittington, asst. extension ento- mologist (6 months) W. E. Dunham, extension apiculturist (1/2 time ext.) |
| Oklahoma..... | Oklahoma A. & M. College..... | Stillwater C. F. Stiles, extension entomologist * |
| Pennsylvania..... | Pennsylvania State College..... | State College H. E. Hodgkiss, extension entomologist * L. E. Dills, asst. extension entomologist * J. O. Pepper, asst. extension entomologist * E. A. Richmond, asst. extension entomologist * E. J. Anderson, asst. in extension bee- keeping * |
| South Carolina... | Clemson Agricultural College of South Carolina..... | Clemson W. C. Nettles, extension entomologist * E. S. Prevost, beekeeping specialist * |

| <u>State</u> | <u>College</u> | <u>Location</u> |
|-------------------|--|-----------------|
| South Dakota..... | South Dakota State College of Agriculture..... | Brookings |
| Texas..... | A. & M. College of Texas..... R. R. Reppert, extension entomologist * | College Station |
| Virginia..... | Virginia Polytechnic Institute..... | Blacksburg |
| Washington..... | State College of Washington..... | Pullman |
| Wisconsin..... | College of Agriculture, University of Wisconsin..... | Madison |

According to the best information available, we now have 22 full-time extension entomologists receiving salaries amounting to \$64,594. There are also 12 men devoting part of their time to extension entomology; the extension portion of their salaries amounts to \$12,287. This makes a grand total of \$76,881 - which is an increase of \$9,571 over the budget for salaries of extension workers in entomology last year. Twenty-two States have one or more full-time or part-time specialists in entomology.

Personnel changes

During the past year many changes have been made in extension entomology personnel. The following list indicates the date, State, person, and change:

1 9 3 6.

February 15--August 15. I. W. Bales. At the end of this appointment Mr. Bales went into commercial work and is to be located at Yakima, Wash.

March 1. Indiana. Mr. G. E. Lehker was appointed full-time extension entomologist.

April 1. Delaware. Paul Rice was appointed to spend two thirds of his time as extension entomologist.

April 1--September 30. Ohio. T. B. Whittington, assistant extension entomologist.

May 1. North Dakota. Fred D. Butcher, extension entomologist, resigned to accept a position in the Bureau of Entomology and Plant Quarantine, and is located at Bozeman, Mont.

May 1. North Dakota. F. Gray Butcher was appointed to succeed his brother Fred. Gray will work on plant pathology as well as on entomology.

September 1. Alabama. W. A. Ruffin returned to his duties as extension entomologist after having been in county agent work during the past 3 years.

November 30. New York. Charles Palm, assistant extension entomologist, resigned to return to research work in New York.

December 1. New York. J. A. Evans was appointed assistant extension entomologist to succeed Charles Palm.

December 15. Iowa. T. Roy Hansberry, assistant extension entomologist, resigned to accept an appointment with the Shell Oil Company at Wood River, Ill.

1937.

January 7. North Carolina. C. H. Brannon, extension entomologist, resigned to accept the position of State entomologist in North Carolina.

February 11. New York. C. R. Crosby, one of the pioneers in extension entomology work, died.

March 15. New York. Dr. R. W. Leiby appointed extension entomologist.

March 15. Iowa. Harold Gunderson appointed assistant extension entomologist to succeed Hansberry.

April 15. North Carolina. J. O. Rowell appointed extension entomologist.

Those of you who do wildlife conservation work will be interested to know that Mr. I. T. Bode has been assigned to the subject-matter staff in Washington, D. C., to represent the Bureau of Biological Survey.

EXCERPTS FROM STATE ANNUAL REPORTS

As a beginning, for the first issue, excerpts on various subjects from several different State annual reports have been chosen. The following excerpts are from reports that have been received thus far, and are arranged alphabetically by States.

Colorado

Insecticides.

Dusts.—This has been a very active project this season. Rotenone and pyrethrum dusts are especially desirable to use on vegetables of the home garden and on truck crops instead of the arsenical and fluorine compounds that

may leave poison residue when the product is prepared for the table or market. Our work has been education as to the use of these materials.

Methods.

Method demonstrations were held in 30 Colorado counties in cooperation with the county agent. Numerous demonstrations have been held on individual farms when work on other projects was being conducted, as well as work on this particular project.

Field days and general entomological meetings provided opportunities to bring this subject to the attention of farmers and ranchers.

News stories carried educational information.

A 4-H club entomology booklet gave a special discussion on nonpoisonous dusts.

A radio talk was given over K.O.A. National Radio Station.

Results.

No shipments of truck or vegetables have been reported as condemned on account of poison residue.

Thirty county agents were equipped with one of the commercial brands of rotenone dust for demonstrational purposes. Some of the agents carried two or three such brands.

Growers were informed as to source of supplies of rotenone dusts, and nearly all insecticide dealers in small and large towns carried at least one reliable brand.

Forty methods and result demonstrations were held in cooperation with 200 growers by the specialist. This figure does not include the large number of demonstrations conducted by agents.

1,200 growers attended two field days, where methods demonstrations were held.

400 pounds of rotenone dusts were used in making demonstrations.

General satisfaction of results obtained were the reports received from growers who used rotenone dusts.

Many other insecticide problems were discussed at general meetings and with individuals interested when the specialist was out on general insect work.

Delaware

Work with home demonstration clubs.

An extensive educational program with home demonstration clubs was carried on in New Castle County. One-hour programs dealing with insects were conducted in four clubs in this county and material was provided so that the home demonstration agent, herself, could arrange for similar meetings in each of the other clubs. A mimeographed circular entitled "Household Insects", dealing with their life history and control, was prepared and distributed to all members of the clubs. A display of the common household insects and insecticides for their control was shown. A talk concerning insects in general and those that infest houses in particular was given, followed by an open forum for discussing control problems.

Six home demonstration clubs were visited in Kent County, and programs similar to those described for New Castle County were followed. In addition, a one-reel film entitled "Why Moths Leave Home" was shown at each meeting. This film, prepared by the United States Department of Agriculture, had been purchased by the Department of Entomology for this purpose. Copies of the circular on household insects were supplied to the Kent County home demonstration agent for distribution to interested members who were not reached in the meetings mentioned above.

Class at 4-H club conference.

One class period at the annual 4-H club conference, held at the University of Delaware, was devoted to insect study. Only boys attended this meeting. A program similar to that given before individual clubs was put on, and, in addition, a film strip on vegetable-garden insects was shown.

Insect collection contest.

Although work on insect collections was not emphasized this year, the premium committee of the Kent-Sussex Fair, Harrington, continued to offer prizes for the best insect collections displayed by 4-H club members. The regulations were so changed that only those collections made during the current year could be entered in the contest. But two collections were displayed. David Nichols, of Farmington, was given first prize, and Walter Coverdale, of the same town, second prize.

Kansas

Nature study for the farm women.

Entomology for the farm women has meant mostly study of garden and household pests. The women of the farm-bureau units wanted to learn more about insects in relation to nature, and they wanted to learn more about natural history. Many of the women wanted to collect insects and learn how to mount them on pins and in glass mounts for study and exhibition. These women

wanted to learn also how to find these insects, find out how they attack plants, and which were friends and which enemies of their crops. As peculiar as it may seem, there were many of the women who wanted to learn the life stories of the insects.

The entomologist learned what these women wanted to do in the project through the home demonstration agents, and therefore planned a year's work for them. The plan of work was as follows:

1. The home demonstration agents were to select one or more women for each unit.
2. Extension Circular M 6 and M 10 were used as guides for the study.
3. Each woman to collect 25 different insects and mount them correctly; the entomologist to assist them in naming the insects.
4. The entomologist to give two lessons and hold achievement day.
 - a. First lesson - The insect. How it lives; how it grows; how it eats; kind of wings; kind of legs; kind of reproduction; and number of generations.
 - b. Second lesson - Insect collecting. Each woman made a cyanide killing jar; learned to use a net; how to pick up the different kinds of insects; where to find the different kinds; and how to pin and make Riker mounts. Then they went to the fields, woodlots, pastures, gardens, and elsewhere that offered good collecting grounds.
5. The women are to be leaders in the project and are to make the collection and show the other women of the units how to do the work.

This kind of work was new and very interesting. The collections made during the first year indicate that the plan should be taken to other counties next year. There are 340 of these women leaders, and reports from the agents indicate that several of them have made a hobby of insect collecting. The number of insects sent to the Entomology Department for identification also indicates that many women are taking up the hobby.

It was difficult to learn how many women exhibited collections on achievement days. It was the intention of the entomologist to attend several of these achievement days, but other work prevented him from doing so. It was difficult also to learn how many of the women exhibited collections at county fairs.

Michigan

Dusting potatoes to control leafhopper.

Leafhopper control gave the potato growers using the recommended practices from 30 to 40 more bushels of potatoes per acre. There was a significant number of new practitioners in this connection as indicated by reports of manufacturers and distributors. Over 2,000 new crank dusters were distributed in the State this year.

Each of these machines probably took care of an average of three growers for the season with a probable increase over material cost of \$20 per acre. The machines cost from \$10 to \$25 each with an average price of slightly over \$15. Their use by small acreage growers has been widely encouraged by the extension entomologist and the extension plant pathologist, and no doubt this partially accounts for the larger number purchased by Michigan growers this year. These growers probably realized a saving estimated on the above basis, of at least \$120,000 on the potential 6,000 acres protected, potatoes being \$1 per bushel. This is, of course, in addition to the protection afforded by similar equipment already in use, and approximately 2,200 power-and-traction-driven sprayers used by potato growers.

Missouri

Entomology in 4-H club camps.

Work in entomology was again undertaken this year. The 4-H club office has been giving some phase of nature-appreciation work in their State camps during the past few years. Some one subject, such as forestry, entomology, or weeds is selected and used as the main educational study at all camps in the State. There are usually about 8 or 9 camps in the State each year.

Entomology work was started during the summer of 1931. It was again selected in 1936 and all except two camps did the work. Over 1,700 boys and girls attended the camps this season and took part in the work.

The insect study was carefully planned in advance, and considered by county agents and home demonstration agents. The boys and girls were asked to bring cigar boxes with a corrugated strip of paper glued to the bottom. After the boys and girls arrived at camp, instructions on the organization for the work were given. All the members were divided into two smaller groups. This permitted the 4-H club staff to have an opportunity to give some information on club work or other subjects. Only the morning period of the day was given over to the educational work. The camps usually lasted 3 days. The following schedule will serve to show how the groups were divided:

| | <u>9 a. m.</u> | <u>10 a. m.</u> | <u>11 a. m.</u> |
|----------|----------------|-----------------|-----------------|
| Group I | Discussion | Field | Laboratory |
| Group II | Field | Laboratory | Discussion |

The groups worked separately each day. During the laboratory period the boys and girls studied the insects caught and recorded the information in a book. The large group that wished to go on the field trip was further broken into smaller working units of about 10 members. Each small unit was given a net and killing jar.

The boys and girls seemed to be interested and found considerable fun in doing the assignments. Insect study fits nicely into camp routine.

Two things especially stood out as essential in conducting the work. First, every boy and girl should be supplied with a collection box and, second and most important, the leaders must be thoroughly familiar with the plans, procedure and what is hoped to be accomplished. This last feature will just about determine whether or not the member will get any work done on the project. It goes without saying that if the leaders would rather play baseball during camp, the boys and girls will also prefer to do so. Should one be interested in reading a complete statement on organization of the work during camp, it is suggested that a copy of the June 1932 issue of the Journal of Economic Entomology be procured. Another paper covering this subject and giving other suggestions for the work will appear in the same journal sometime this year.

In the appendix one will find a form of the record book used. Each club member was to collect at least 10 different kinds of insects and have them properly pinned and labelled. Illustrative material was available for study on the walls in the laboratory space, and the boys and girls used this material to good advantage. U. S. Department of Agriculture Farmers' Bulletin No. 1601, Collection and Prevention of Insects, was fastened into the back of the record book. The members, of course, kept the collection and record books.

It is felt that this work will lead to the formation of a 4-H entomology club in the State. Perhaps this will be done in 1937. Indications to date seem to be that the work would be well received. Through better training it will help to prepare the future farmers to combat insect problems on the farm.

Hessian fly.

The Hessian fly increased in number during the spring and summer of 1935, and the 1936 wheat crop in the southern two-thirds of the State was severely attacked. Some 500,000 acres in 60 counties were involved in the heavily infested area. Many fields seeded before the proper seeding dates were abandoned and in others at least 50 percent of the stands died before December. Fifty maggots per plant were not uncommon.

Hold everything!

Many farmers were so discouraged that they wanted to destroy the crop and reseed; others were planning to put the fields in corn. The Extension

Service recommended that the growers wait until late April before a decision was made. The inevitable seemed to have happened during April. The spring brood of flies did not materialize. Severe cold weather was had during the middle of April and temperature dropped to about 15 above zero in central Missouri. The wheat plants came on, stooled out, and many of the fields that had less than half of their original stands, threshed 12 to 15 bushels of grain. Many fields, however, were reseeded to oats because no more than one-tenth of a stand survived. Fields seeded on or slightly after the "fly free date" threshed unusually good yields.

Yield and date of seeding tests.

The plots in the date of seeding tests here at Columbia seeded on and after the proper dates threshed out almost twice as much grain as was threshed from the earlier seeded plots. Wheat was selling at about \$1. per bushel, and this much difference in production was an effective way of calling a farmer's attention to the importance of the proper recommendations. Had the spring brood developed as expected, the loss, no doubt, would have exceeded the 1915-16 losses due to the fly. Though the acreage seeded before the "safe dates" in 1935-36 was fairly high in certain counties, the total acreage figure was undoubtedly not as great as in 1915-16. Many farmers remembered their earlier experience. However, many farmers had sown their wheat early for pasture.

Barley for fall pasture.

The subject of barley for fall pasture brings up the question of whether or not the Hessian fly will build up in it and cause trouble for wheat growers. Many fields of barley were in the heavily infested areas in 1936. These fields were slightly infested, but practically none of the stands were killed out. The fields gave good pasturage and threshed good yields in the spring. Some fields died out in patches prior to December, but these fields showed no more flies than fields of good stands. Frost injury, variety of seed, poor seedbed, and other causes seemingly were the factors. There are many more fields of barley in the State this fall, and evidence to date seems to indicate that the "barley for fall pasture" recommendation does not aggravate the fly problem. Quite naturally the field crop specialists are watching developments very carefully.

Nebraska

Horse bots and botflies.

This work was carried on in several counties on a limited scale in 1933 and 1935. Demand for the work increased rapidly, and 25 counties requested such work in 1936. Expansion of the work to such an extent in a single year was impossible, but a county-wide campaign was carried on in Colfax County, and a limited amount of the work was done in 14 other counties.

In Colfax County the work was organized on a precinct basis, with a committee of farmers in charge in each precinct. Treatment in all cases was given by a qualified veterinarian. Results were very satisfactory. Over 90 percent of the horses and mules in the county were treated, and but for bad weather and impassable roads, treatment would have approached the 100 percent mark. Approximately 4,000 horses and mules were treated and in the other counties carrying on such work approximately 6,000 head were treated.

A circular on organizing and conducting a campaign for botfly control was prepared and furnished to all county agricultural agents.

The goal in this subdivision was to have systematic botfly control campaigns carried on in 12 counties, 5,000 horses and mules to be treated for bots.

This goal was exceeded both in number of animals treated and in counties carrying on the work. The work will be continued in 1937, and it is hoped that it may be increased by at least 50 percent.

New York

Insect pests of ornamentals.

The work on insect pests of ornamentals is being carried on along much the same lines as that of the spray information service which has been so successful in work with fruit, vegetable, and potato growers. In the departments of plant pathology, floriculture and ornamental horticulture, and forestry, the work has been conducted in close cooperation with the specialists. Most of the field work is carried on through the county agricultural agents.

Training schools.

County agricultural agents are being trained in subject matter through: Training schools at the college; contact with the specialist at meetings; tours; farm visits; exhibits in the counties; and correspondence with the specialists. A 2-day training school in entomology was conducted by the specialist just previous to the annual extension conference at Ithaca. The school was attended by about 25 county agricultural agents and assistants. One session was devoted to a discussion of insect pests of ornamentals. The assistant also discussed the control of such insect pests at a 3-day training school for county agricultural agents and home demonstration agents held by the department of floriculture and ornamental horticulture. One-, two-, and three-day meetings for florists, nurserymen, estate superintendents, and garden-club members were held in Nassau, Suffolk, Westchester, Rockland, Albany, Schenectady, Chemung, Erie, and Niagara Counties. About 2,500 persons have been contacted through such lectures and discussion groups. The florist and nursery industries are most important in the counties near the larger cities, and for this reason the work has been most actively conducted in these counties.

Tours.

"Tours for florists have been held in Nassau, Rockland, Chemung, and Suffolk Counties. From 5 to 10 greenhouses are visited on each tour, and the specialist gives a brief discussion of special insect-control problems at each stop, and a talk or group discussion is had during the noon hour stop. These tours have been well attended and of considerable interest and profit to growers. At various times during the season the specialist has been scheduled by the county agricultural agents for 1, 2, or 3 days for farm visits to florists and nurserymen to help them with their particular problems on insect control and to give the specialist an opportunity to become more familiar with local and seasonal variations in the insect problems.

Exhibits.

Extensive exhibits dealing with insect pests of ornamentals and their control have been shown at the State fair, the Westchester County flower show (sponsored by the combined agricultural and horticultural societies and the garden clubs), the Nassau-Queens County Fair, the Orange County Fair, the Empire State Gladiolus Show, and Farm and Home Week at the college. In connection with these exhibits on insect and diseases a clinic was conducted by the entomology and plant-pathology specialists. Many people availed themselves of the opportunity to bring in specimens of insects or insect injury for diagnosis and information on control. These exhibits and clinics have attracted considerable interest and appear to be a worth-while extension activity in suburban counties.

Ohio

Exhibits.

The specialist cooperated with the Ohio Agricultural Experiment Station in exhibiting 7 major corn insect pests and their control at the National Corn Husking Contest held at Hebron, Licking County, in November. Thousands of visitors saw this exhibit.

Schools for insecticide dealers.

The specialist met with the insecticide dealers at Elyria, Akron, Ravenna, and Cambridge and discussed with them the various uses of commercial insecticides and fungicides. A similar meeting was held with the county agents of southeastern Ohio at Marietta. We have been holding such meetings for 5 years, and by keeping the dealers as well as the county agents posted on pest-control methods we are able to amplify our recommendations for vegetable and ornamental plants through interested dealers. These men are anxious to sell their service as well as their products.

Vegetable growers tours.

Demonstrations on the use of rotenone dust were made during the county vegetable growers' tours in Lake and Ashtabula Counties during July. Rotenone dust was used by the State relief commission in the relief gardens and gave excellent control of the Mexican bean beetle and of cabbage worms. We have made it a point to visit the insecticide dealers when we are on the road and to look over their stock of insecticides. In this way dealers are being helped to keep up-to-date and to give better service to their customers.

Pennsylvania.

Spraying information - apples.

Apple spraying information was given in 54 counties at the request of 7,636 farmers. In six other counties 87 farmers requested that letters be sent to them from adjoining counties where the project was operated. The outstanding phase of this project that received particular attention was the modification of codling-moth control recommendations. In the counties where the heaviest infestation occurs excessive poisonous residues were avoided without sacrificing the effectiveness of the insecticides.

Not all the farmers to whom the spraying information is sent apply all the sprays recommended. The results of their efforts therefore are variable and the local interpretations that subsequently may be given to these results are often incorrect. In order to be able to advise these men as to a proper interpretation of their observations a survey was made of 350 apple orchards in the 54 counties at harvest. These records were taken in orchards where the total crop was 2,576,885 bushels, or approximately 36.4 percent of the entire State yield. In 106 orchards that received all the sprays, 97.3 percent of the apples were free from insect injuries. There were 225 orchards in which one or more insecticidal sprays were omitted and in these only 87.6 percent of the apples were clean. Nineteen orchards that received no sprays averaged 33.1 percent clean fruit.

The estimated total yield of apples this year was 7,072,000 bushels. Using the check-up figures as a basis for computation, the value of the insect-suppression part of the spraying information to the apple growers in Pennsylvania was \$2,096,848.

Timely Topics

We hear that the teaching of entomology work at Massachusetts State College is to be set up as a department independent of the Department of Zoology and Geology. Dr. C. P. Alexander will serve as head of the Department of Entomology and Dr. C. E. Gordon will remain head of the Department of Zoology and Geology.

Nature-guide school.

To train leaders in various aspects of nature activity and to offer a further understanding and appreciation of outdoor surroundings is the purpose of a new nature-guide school which is to open at Massachusetts State College this summer, reports the college. A 6-week course will be presented, with variations to be offered in the course in successive summers over a 4-year period. A nature-guide's certificate will be awarded at the end of the 4 years' training. An effort will be made to equip young men and women for such positions as ranger naturalists for national parks, nature counselors in summer camps, scout naturalists, and 4-H club leaders. (Press.)

Toxicity of Rotenone and Derris.*

"Dr. H. B. Haag, collaborating pharmacologist for the Department at the Medical College of Virginia, has published (Soap, January) a comparison of the toxicities of lead arsenate and other insecticides as contrasted with those of rotenone and derris. When fed to rabbits rotenone has only 1/30 the acute toxicity of lead arsenate and only 1/100 the acute toxicity of nicotine. Derris contains unknown constituents that are more poisonous than rotenone to animals but Dr. Haag has calculated that for a man to get an acutely fatal dose of derris he would have to eat 4,000 apples bearing the excessively high spray deposit of 0.06 grain derris (10 percent rotenone) per pound. The Bureau of Entomology and Plant Quarantine recommends for the control of cabbage worms, Mexican bean beetle and certain other vegetable insect pests, a dust made from talc or clay and powdered derris and containing not more than 1 percent rotenone. In order for a man to get an acute toxic dose of this dust he would have to eat 360 grams of it, equivalent to about 4/5 of a pound. It is doubtful if one could swallow this quantity even with suicidal intent because one of the first effects of derris is to cause vomiting...Derris residues on foodstuffs are not a menace to health because: (1) the amount present even immediately following application is small; (2) this residue, small as it is, is rapidly reduced by weathering because derris adheres poorly as compared with lead arsenate; (3) rotenone and the other constituents in the derris are rapidly decomposed by exposure to sunlight and air and these decomposition products are inert when fed to animals."

* Permission has been granted to reproduce the entire article, which consists of about 1800 words. If entomologists wish to see it let it be known and this article will be used in a later issue.

Plane-spread diseases.

"The suspicion that ephemeral fever (3-day sickness) was introduced into Queensland cattle by an insect carried from another country in an aeroplane reveals the possibilities of other and more serious diseases, to both man and beast, being introduced in a similar manner", says an editorial in the Pastoral Review (Melbourne, February 16). "It savours of an attack from the air, and points to a weakness in our defences. Precautionary measures have been taken to combat every known seaborne disease, but scientists have now a difficult problem, the significance of which, with the rapid development of air transport from all countries of the world, will be readily appreciated. The shortening of space and time by air travel has brought us into very close contact with hotbeds of disease--a danger to our high standards of animal and human health. Scientists have, no doubt, a wealth of information about disease-carrying insects, but however few these may be, the means of preventing their carriage into this country by aeroplane present great difficulties...The Commonwealth Health Department has already issued instructions that planes are to be treated with a mosquito-destroying preparation at the last port before reaching Australia. Possibly we may also see Australian airports, equipped with highly attractive insect traps--not that either precaution will provide an absolute guarantee that some small 'bug' does not gain entry..."

Poison for locusts.

A campaign against locusts in Argentina has proved that sodium arsenate is effective in poisoning this pest which is credited with destroying approximately 30 percent of the country's agricultural crop, according to the Commerce Department's Chemical Division. During the past year the Minister of Agriculture of Argentina has been experimenting with locust meal, as a fertilizer, the meal being made by grinding the dried bodies of locusts. It is anticipated that between 2,000 and 3,000 tons of locust meal, containing 9.66 percent nitrogen, will be available for export during the current season, according to the Commerce Department.

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